

CLAIMS

What is claimed is:

1 1. A valve assembly for incorporation into a completion system, the valve assembly
2 selectively providing fluid communication with a wellbore annulus comprising:

3 a tubular inner mandrel defining a flowbore within and having first and second
4 ends;

5 a fluid flow port disposed within the inner mandrel to permit fluid communication
6 between the flowbore and an annulus area radially exterior of the inner mandrel;

7 an outer sleeve radially surrounding the inner mandrel, the outer sleeve being
8 moveable with respect to the inner mandrel between a substantially open position,
9 wherein the outer sleeve substantially does not block the fluid flow port, and a
10 substantially closed position, wherein the outer sleeve substantially does block the fluid
11 flow port; and

12 a frangible rupture member disposed within the fluid flow port, the rupture
13 member being rupturable in response to a first level of fluid pressure within the
14 flowbore.

1 2. The valve assembly of claim 1 further comprising an inner sleeve contained
2 within the flowbore of the inner mandrel, the inner sleeve being moveable between a
3 substantially open position, wherein the inner sleeve substantially does not block the
4 fluid flow port, and a substantially closed position, wherein the inner sleeve substantially
5 does block the fluid flow port.

1 3. The valve assembly of claim 1 wherein the outer sleeve presents a pressure-
2 receiving area so that an increase of fluid pressure upon the pressure receiving area
3 moves the outer sleeve from the substantially open position to the substantially closed
4 position.

1 4. The valve assembly of claim 2 wherein the inner sleeve presents a profile for
2 selective engagement by a shifter in order to axially move the inner sleeve from the
3 substantially open position to the substantially closed position.

1 5. The valve assembly of claim 1 wherein the outer sleeve presents an axially-
2 located pressure receiving area, and the outer sleeve is moveable between the
3 substantially open and substantially closed positions in response to a second level of
4 fluid pressure upon the pressure receiving area.

1 6. The valve assembly of claim 5 wherein the outer sleeve is selectively secured to
2 the inner mandrel by a frangible pin that is broken upon application of the second level
3 of fluid pressure to the pressure-receiving area.

1 7. A system for cleaning excess cement from a completion assembly in conjunction
2 with a cementing operation and to prepare the completion assembly for production of
3 hydrocarbons from a downhole formation, the system comprising:
4 a flowbore defined along the length of the completion assembly along which
5 cement or hydrocarbon fluids may be flowed;

6 a valve assembly incorporated into the completion assembly for providing
7 selective fluid communication between the flowbore and an annular space surrounding
8 the completion assembly; and
9 a device for selectively closing a lower end of the flowbore from fluid flow.

1 8. The system of claim 7 wherein the means for selectively closing a lower end of
2 the flowbore comprises a plug member that is landed in a complimentary landing seat
3 within the flowbore.

1 9. The system of claim 8 wherein the plug member comprises a wiper plug having
2 at least one wiper disc for wiping of excess cement from the completion assembly.

1 10. The system of claim 7 wherein a first level of fluid pressure within the flowbore
2 selectively opens the valve assembly.

1 11. The system of claim 7 wherein a second level of fluid pressure within the
2 flowbore and the annular space closes the valve assembly.

1 12. The system of claim 7 wherein the valve assembly is substantially closable by a
2 shifting tool.

1 13. The system of claim 7 wherein the valve assembly includes a fluid flow opening
2 that provides for fluid communication between the flowbore and the annular space, the

3 fluid flow opening being initially closed by a frangible rupture member that will rupture
4 upon application of a first fluid pressure level to the valve assembly.

1 14. The system of claim 7 wherein the valve assembly comprises:
2 an inner mandrel containing a lateral fluid flow opening; and
3 a first sleeve that is moveable with respect the inner mandrel to selectively open
4 and close the fluid flow opening to fluid flow therethrough.

1 15. The system of claim 14 wherein the first sleeve is moveable in response to fluid
2 pressure that is applied to the valve assembly.

1 16. The system of claim 14 wherein the valve assembly further comprises a second
2 sleeve that is moveable with respect the inner mandrel to selectively open and close the
3 fluid flow opening to fluid flow therethrough.

1 17. The system of claim 16 wherein the second sleeve is manually actuatable by
2 means of a shifting tool.

1 18. A method for operating a valve assembly having an axial flowbore and
2 incorporated within a wellbore completion system, the method comprising the steps of:
3 applying a first level of fluid pressure to the valve assembly to open a fluid flow
4 port in the valve assembly;

5 circulating well working fluid into the flowbore, through the fluid flow port, and into
6 an annular space radially surrounding the valve assembly; and
7 applying a second level of fluid pressure to the valve assembly to close the fluid
8 flow port.

1 19. The method of claim 18 wherein the step of applying a first level of fluid pressure
2 to open the fluid flow port further comprises rupturing a frangible rupture member.

1 20. The method of claim 18 wherein the step of applying a second level of fluid
2 pressure to close the fluid flow port further comprises moving a sleeve of the valve
3 assembly.

1 21. The method of claim 18 further comprising the step of manually closing the fluid
2 port in the event that the second level of fluid pressure fails to close the fluid flow port.